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DEPARTMENT OF THE ARMY  
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## INFECTIONS AND FEMALE PERSONNEL IN THE LABORATORY

/Following is translation of an article by Joachim Albrecht in the German-language periodical Deutsches Arzteblatt (Journal of the German Physician) Vol. 60, No. 36, Sep 30, pp. 1775-1776./ .

With progress in science and technology, laboratory tests are being extended to an increasing circle of pathogens. Methods of examination are becoming more numerous and more complicated. As a consequence, infections contracted in the laboratory show a greater volume and incidence.

In 1950, toxoplasmosis was an almost unknown disease of which only 150 cases had been reported so far in literature. Ten years later, Genz (3) already reported 28 cases of toxoplasmosis contracted in the laboratory, including 2 with exitus. Through questioning and from literature, Sulkin (6) collected 2,348 laboratory infections of various origin which occurred primarily in the United States and in which 107 (about 4%) terminated in exitus. During the last 5 years, we noted among our own collaborators four infections contracted in the laboratory including 1 each of tuberculosis, hepatitis, brucellosis and "Sonne" dysentery. Even the statistics of the professional associations will not reflect the true number of laboratory infections. Clinically non-apparent or slight infections do not result in sick leave and are consequently not recorded. Other infections are considered as contracted outside of work due to ignorance of the modality of infection.

In some cases a laboratory accident, e.g. explosion of a culture vessel, gives rise to a then massive transmission of infectious germs. It is also not infrequent that laboratory personnel contracts a disease although an "accident" could not be determined. These may be either clinically manifest or only immunologically demonstrable manifestations caused by pathogens or occasionally by their toxins with which the profession of the patient brings the latter into contact. There is a tendency to assume an affection contracted outside of work, especially where such ubiquitous endemic diseases are tuberculosis, hepatitis, or toxoplasmosis are concerned.

Recent investigations have shown that pathogens may escape even careful control in the laboratory and endanger the personnel even when all customary regulations for the prevention of accidents in the laboratory are observed. Almost any laboratory process can lead to the creation of a spray or aerosol containing germs and thus cause the transmission of infectious agents to laboratory personnel (1, 2, 6). The risk to personnel is particularly increased by the fact that such an occurrence is generally not noticed or not recognized in activities considered harmless. It has also been demonstrated that the inception of an aerogenic infection frequently requires only very few germs (4, 5, 7).

Manipulation of infectious material and/or active infectious agent therefore always constitutes a risk for those occupied in such activities. A causal connection between the activity and the injurious effect on the one hand as well as the action and the disease on the other hand therefore always exist for diseases caused by germs which are handled by the affected individual in the laboratory.

In contrast to England and the United States, primarily female personnel is employed in German medical laboratories. This is in part due to tradition and in part to economic and social reasons. According to the "Law on the Practice of the Profession of Female Laboratory Technician," activities in the field of microbiology are restricted to those persons which have received the training prescribed by this law. However, the present pay scales for female medical laboratory technicians do not correspond to the time and cost of the training. There are -- primarily male -- positions which are regarded as socially at a higher level, are better paid and training in which can be acquired within approximately the same period of time.

Male and female laboratory personnel are exposed to laboratory risks to the same extent. Some infectious diseases may have grave consequences for women because they may result in embryonic or fetal injury in case of pregnancy. Such diseases include toxoplasmosis, listeriosis and some virus infections. Genz (3) quotes Sabin who determined a connatal toxoplasmosis in a two-year old child with hydrocephalus. The mother was employed in a laboratory and had a high antibody titer but no other clinical symptoms of the disease. In the "Law for the Protection of the Female Worker During Pregnancy", a section provides that pregnant women shall not be exposed to the action of substances injurious to health. In spite of this, embryopathy may occur when the infection takes place before or shortly after the beginning of pregnancy. We need hardly mention how difficult it often is to observe, in the laboratory, the provisions of the law for the protection of pregnant women and to miss a fully trained collaborator for a long period of time without interference with the efficiency of the laboratory.

In order to prevent the risk of embryonic or fetal injury in laboratories working with agents of embryopathy as well as with other highly infectious and dangerous germs such as rickettsia, smallpox or plague,

primarily male personnel should be employed in them. However, without the existence of certain prerequisites, this demand cannot be realized so that the following suggestions are advanced:

- 1) The law on the exercise of the profession of female medical laboratory technicians should be changed in the sense that, for certain work in connection with dangerous pathogens, personnel without the prescribed training may be utilized. This would make male laboratory personnel and employees and/or technicians available for such work.
- 2) The profession of female medical laboratory technician should be placed on a sound economic basis and thus be made attractive also for male applicants. This could be accomplished by transferring personnel subject to the "MTA Law" and paid on the basis of the pay scale for federal employees, from grade V to grade IV if they are required to handle especially dangerous pathogens. Where the necessary prerequisites exist, transfer to civil service status (in the higher stages) should be provided in the public services because increased specialization implies also an increased independence and responsibility in exercising the profession of female medical laboratory technicians.

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It will also be obviously necessary to amplify protective measures and improve protective devices (8) in order to reduce infections in the laboratory. In the case of new construction, special attention should be given to the findings on the creation and propagation of infectious aerosols in the laboratory.

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